



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: O'Donnell, et al.

Serial No.: 09/921,803

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Group Art Unit: 3652

Examiner: Tran, Thuy Van

Title: ELEVATOR BELT ASSEMBLY WITH  
WAXLESS COATING

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**APPEAL BRIEF**

Box AF  
Commissioner for Patents  
P. O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

The Notice of Appeal in this application was filed on January 21, 2004. Appellant now submits its brief in the above-referenced application. A Credit Card Payment Form in the amount of \$330.00 is enclosed. The Commissioner is authorized to charge Deposit Account No. 50-1482 in the name of Carlson, Gaskey & Olds for any additional fees or credit the account for any overpayment.

**Real Party in Interest**

Otis Elevator Company is the real party in interest.

**Related Appeals and Interferences**

There are no related appeals or interferences.

### **Status of the Claims**

Claims 6-8 and 16-23 are on appeal.

Claims 6, 7, 16, 17, 21 and 23 stand rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 4,550,559.

Claims 6-8 and 16-23 stand rejected under 35 U.S.C. §103 as being unpatentable over U.S. Patent No. 6,392,551 in view of U.S. Patent Nos. '3,892,531 and 3,724,322.

Claims 18-20 and 22 stand rejected under 35 U.S.C. §103 as being unpatentable over U.S. Patent No. 4,550,559.

### **Status of Amendments**

There are no unentered amendments.

### **Summary of the Invention**

Elevator systems often include a load bearing member such as a rope or belt that suspends a car and counterweight within a hoistway. More recently, polyurethane coatings over a plurality of tension members have been introduced. One difficulty associated with conventional urethane coatings is that the urethane material as it is provided by a supplier typically includes one or more waxes. The waxes typically are included as part of the urethane manufacturing process. One reason for including such wax is to facilitate molding processes when, for example, the additive wax acts as an internal mold release agent. (Paragraphs 2 and 3)

In elevator systems, the presence of the wax within the urethane stock material tends to interfere with the desired traction or friction characteristics of the urethane coating as it interacts

with sheaves in the elevator system. Having a desired amount of friction to achieve a desired amount of traction within an elevator system is an important concern. (Paragraph 4)

In one embodiment of the claimed invention, a load bearing assembly 26 is formed as a belt. A plurality of load bearing members 40 are covered with a urethane coating 42. (Paragraph 12 and 13)

The material used to make the urethane coating does not contain any waxes. The typical stearate-based waxes that are routinely added to urethane materials are not included in the material of the urethane coating 42. Therefore, the urethane coating 42 can be considered waxless. (Paragraph 14)

Independent claim 6 recites a method of making an elevator rope that includes coating load carrying members with a urethane coating that does not contain wax.

Independent claim 18 recites a method of making an elevator belt that includes coating a plurality of elongate load carrying members with a rectangular, waxless urethane coating.

Independent claim 21 recites a method of making an elevator rope assembly by coating an entire plurality of elongate load carrying members with a single, waxless, urethane coating.

The various dependent claims add various method steps.

## Issues

Whether the final rejection under 35 U.S.C. §102 is proper when there is nothing within the reference relied upon by the Examiner that teaches or even suggests using a waxless urethane.

Whether the final rejections under 35 U.S.C. §103 are proper where there is no motivation for making the proposed combinations because there is no benefit for doing so and where the results of the improper combinations are not the same as the claimed invention.

### **Grouping of Claims**

Every rejection of claims 6-8 and 16-23 are contested.

#### **1. The rejection under 35 U.S.C. §102(b).**

Claims 6, 7, 16, 17, 21 and 23 are rejected under 35 U.S.C. §102(b).

Claims 6 and 7 stand or fall together with respect to this rejection for purposes of this appeal.

Claim 16 stands alone with respect to this rejection for purposes of this appeal.

Claim 17 stands alone with respect to this rejection for purposes of this appeal.

Claims 21 and 23 stand or fall together with respect to this rejection for purposes of this appeal.

#### **2. The rejection under 35 U.S.C. §103 based on *DeAngelis*.**

Claims 6-8 and 16-23 are rejected under 35 U.S.C. §103 based upon *DeAngelis* combined with *Graff* or *Scudder*. Claims 6-8 and 16-23 all stand or fall together with respect to this rejection for purposes of this appeal.

#### **3. The rejection under 35 U.S.C. §103 based on *Thomson*.**

Claims 18-20 and 22 are rejected under 35 U.S.C. §103 based on *Thomson*.

Claims 18 and 19 stand or fall together with respect to this rejection for purposes of this appeal.

Claim 20 stands alone with respect to this rejection for purposes of this appeal.

Claim 22 stands alone with respect to this rejection for purposes of this appeal.

## **Argument**

### **INTRODUCTION**

None of the claims are anticipated because none of the cited references teach using a waxless polyurethane, which is contrary to the conventional approach. Without a specific statement in the cited references indicating that they go contrary to the industry standard, they cannot be interpreted to teach a waxless polyurethane. Further, none of the claims are obvious because there is no proper motivation or suggestion within the art to make the Examiner's proposed combinations and the improper combinations proposed by the Examiner are not the same as the claimed invention.

### **THE CITED REFERENCES**

#### **A. United States Patent No. 4,550,559 ("the *Thomson* reference")**

The *Thomson* reference discloses a particular type of cable arrangement in which strands are covered with individual sheaths of a plastic or rubber material. Individual strands 10 are formed and passed through an extruding die 12 (see Figure 2). "The die 12 has a generally trapezoidal shape with straight but converging sides 13 interconnecting at their closer spaced ends by a shorter convex end 14 and interconnected at their further spaced ends by a concave arcuate end 15." Column 2, lines 48-52.

A die 12 is rotated during extrusion to cause the sheath "to extend spirally around the strand." Column 3, line 18. The spiral configuration of the sheaths allows for interconnecting the strands in a manner that keeps them from moving relative to each other. When all the strands are put together, the cable includes adjacent sheaths having side surfaces that are "in face-to-face

engagement. In addition, the wider surfaces of the strands form a continuous cylindrical outer surface to the cable. This construction has a number of benefits." Column 3, lines 59-63. The *Thomson* reference then goes on to describe nine different benefits of the disclosed arrangement. Included among those are:

4. The cylindrical outer surface provides a large area for frictional grip between the cable and, for example, a drive pulley, thereby reducing the stress induced in the sheath by the transmission of torque from the drive pulley to the cable.

5. The cylindrical outer surface presents a large bearing area to a support pulley and results in reduced bearing pressure between such a pulley and the cable, or permits the use of greater pulley loads for the same bearing pressure. This advantage makes it possible to use such a cable with a V-section pulley, which cannot be used with previous cables because of the high bearing pressures between such a pulley and the individual strands which pinch such a cable and cause the strands to be forced out of their geometry configuration, i.e., the cable will tend to flatten.

Column 4, lines 12-27.

The *Thomson* reference does not teach using a waxless polyurethane for any of the sheaves in the cable. The only materials mentioned are found in column 2, lines 40-47. One of the mentioned materials is "polyurathane."

Conventional polyurethane materials are supplied with wax additives that act, in part, as internal mold release agents. Because the *Thomson* reference nowhere discloses going against the conventional wisdom of having wax additives within a polyurethane material, it cannot fairly be interpreted as teaching one that does not include the typical, conventional wax additives. *Thomson* nowhere discloses using a waxless urethane material.

**B. United States Patent No. 6,392,551 (“the *DeAngelis* reference”)**

The *DeAngelis* reference is primarily concerned with having an electrically conductive member within a synthetic fiber cable. In column 3, lines 2-12, the *DeAngelis* reference teaches a cable sheathing 8, preferably formed of polyurethane or polyamide material. “The cable sheathing 8 is extrusion molded.”

There is no other discussion of materials for the outer sheathing 8 of the *DeAngelis* arrangement. There is no discussion within *DeAngelis* for using a waxless polyurethane (i.e., one that does not include the typically included wax additives).

**C. United States Patent No. 3,829,531 (“the *Graff* reference”)**

The *Graff* reference is concerned with making transparent thermoplastic articles that are not susceptible to hazing. In column 1, the *Graff* reference clearly teaches that it is concerned with transparent sheaths such as unbreakable windows and bullet-resistant bank teller protection items. Lines 49-57 state the objects of the invention of *Graff* and include, “to provide impact-modified thermoplastic articles which are resistant to haze at varying temperature and humidity environments ... to provide polymerizable compositions for preparing transparent, impact-resistant thermoplastic articles ... to provide an improved method of continuously casting impact resistant transparent thermoplastic sheet.”

The thermoplastic articles of the *Graff* reference have nothing to do with elevator load bearing member assemblies. The types of thermoplastic articles that are the subject of the *Graff* reference have substantially different qualities and characteristics than a polyurethane coating on a plurality of tension members in an elevator belt, for example.

**D. United States Patent No. 3,274,322 (the “*Scudder* reference”)**

The *Scudder* reference teaches applying a layer of polyurethane to a core of a belt, wheel or roll, for example. The *Scudder* reference teaches flowing a layer of polyurethane onto a moving surface and then “subjecting the applied layer to the leveling effect of a second moving surface.” Column 1, lines 34-35. The polyurethane is in a semi-cured state when the second moving surface encounters the polyurethane layer. To avoid having the semi-plastic, “sticky,” partially cured polyurethane adhere to that second surface, the *Scudder* reference teaches applying “liberally, a lubricating barrier in the form of a layer of oily substance, or a thick film, over the layer of polyurethane prior to its being engaged by the second moving surface and in sufficient quantity to completely envelope the exposed surface of the polyurethane.” Column 1, lines 41-46.

The particular approach taken in the *Scudder* reference is not useful for making elevator ropes or belts. The Examiner proposes to combine the teachings of *Scudder* with that of *DeAngelis*, stating that the *Scudder* reference teaches using a mold release agent that would be useful in the *DeAngelis* reference. As will be discussed below, the *Scudder* reference does not have any applicability to the *DeAngelis* reference or the field of Applicant’s claimed invention.

**THE REJECTION UNDER 35 U.S.C. §102(b) IS IMPROPER**

Claims 6, 7, 16, 17, 21 and 23 were rejected by the Examiner under 35 U.S.C. §102(b) based on the *Thomson* reference. As noted above, the *Thomson* reference is completely void of any mention of using a waxless urethane to form any of the sheaths of that arrangement. Without an express statement in that regard, the *Thomson* reference cannot fairly be interpreted as teaching a waxless urethane (i.e., one not including the wax additives that are normally added to polyurethane stock material).

It is well known in the industry that polyurethane stock material includes wax additives. One reason for adding wax is to provide an internal mold release agent. The *Kuo, et al.* reference (U.S. Patent No. 4,585,829), which is of record in this application, teaches, for example, that it is conventional practice to include a wax additive in a polyurethane to act as an internal mold release agent. Column 1, lines 32-40 and column 2-column 3, line 25 of the *Kuo, et al.* reference discuss typical polyurethane preparations. At best, the *Thomson* reference mentions using "polyurathane" as a material for making the sheaths in that reference. Without an express statement that the material is or should be a waxless urethane, that reference cannot be interpreted to be going against the conventional wisdom. A term should be given its normal, ordinary meaning or understanding unless there is an indication to interpret it otherwise. In the *Thomson* reference there is nothing that indicates using a polyurethane other than that which is conventionally known and such polyurethanes include wax.

The Examiner's contention that *Thomson*'s silence about adding wax can be interpreted to teach a waxless polyurethane is baseless and contrary to the conventional understanding of polyurethanes used in this field.

There can be no anticipation because *Thomson* fails to disclose a waxless urethane.

#### **CLAIMS 6 AND 7 ARE NOT ANTICIPATED**

Claim 6 recites a method of making an elevator rope assembly that includes coating load carrying members with a urethane coating that does not contain wax. This is nowhere taught within *Thomson*. There is no anticipation.

**CLAIM 16 IS SEPARATELY PATENTABLE**

Claim 16 adds the limitation of coating the load carrying member such that the urethane coating has a rectangular cross-section. Nothing in *Thomson* can be construed as disclosing a rectangular cross-section. In fact, *Thomson* specifically discloses the cylindrical overall arrangement and the intermediate “trapezoidal” arrangements for forming the cable of *Thomson*. That arrangement cannot possibly be construed as disclosing a rectangular cross-section. Even if *Thomson* could somehow be distorted such that it would be considered to teach a waxless urethane, nothing within that reference teaches a rectangular cross-section.

**CLAIM 17 IS SEPARATELY PATENTABLE**

Claim 17 adds the limitation of coating the entire plurality of load carrying members with a single urethane coating. This is not taught by *Thomson*. *Thomson* clearly discloses coating individual strands with individual sheaths. The single urethane coating of claim 17 has no correspondence in *Thomson*, which requires a plurality of coatings over a plurality of strands. *Thomson* expressly teaches using more than a single coating and, therefore, there is no anticipation of claim 17.

**CLAIMS 21 AND 23 ARE NOT ANTICIPATED**

Claim 21 recites coating an entire plurality of elongate load carrying members with a single, waxless, urethane coating. The *Thomson* reference fails to disclose a waxless urethane coating. Additionally, the *Thomson* reference discloses a plurality of sheaths over the strands within the *Thomson* cable. Accordingly, *Thomson* does not teach using a single coating. A plurality of

coatings does not anticipate an arrangement that is specifically limited to only one (i.e., "single") coating.

The rejection under 35 U.S.C. §102(b) should be reversed.

**THE REJECTIONS UNDER 35 U.S.C. §103  
BASED UPON *DeANGELIS* ARE IMPROPER**

It is axiomatic that there must be a sufficient legal motivation for making a combination of references to establish a *prima facie* case of obviousness. In this instance, there is no benefit to making the Examiner's proposed combination. Additionally, the proposed combination would defeat the intended operation of the device disclosed in the *DeAngelis* reference. Where a proposed combination provides no benefit or defeats an intended function or operation of the primary reference, there is no motivation and no *prima facie* case of obviousness.

Additionally, even if the combination were made, it is not the same as the claimed invention. The cited references are void of any teaching or suggestion for using a waxless urethane as claimed.

The *DeAngelis* reference is concerned with a synthetic fiber cable having a polyurethane or polyamide sheathing 8 on a support element (i.e., rope) that is used for elevators. The *DeAngelis* reference teaches that the sheathing 8 is "extrusion molded" over the strands of the cable 1. The *DeAngelis* reference is silent regarding any particular processing required for using the polyurethane material, which is itself not qualified in any manner in the *DeAngelis* reference. According to conventional knowledge, the polyurethane material mentioned in *DeAngelis* would contain wax additives as well known in the industry. There is nothing within the *DeAngelis* reference that is concerned in any way with any particular molding requirements such as the need for a mold release agent to be added during processing.

The Examiner proposes to combine the *Graff* or *Scudder* references with *DeAngelis* in an attempt to establish a *prima facie* case of obviousness against claims 6-8 and 16-23. There is no motivation for combining either reference with *DeAngelis* and, therefore, none of the claims can be considered obvious.

There is no motivation for combining the teachings of *Graff* with *DeAngelis* because they are from completely different fields of endeavor and there would be no benefit to adding anything from the teachings of *Graff* to the *DeAngelis* arrangement. The *Graff* reference is concerned with clear, impact-resistant, thermoplastic sheets that can be used as bullet-proof windows, for example. Such a material has no relevance to the *DeAngelis* arrangement which requires flexibility for the cable to wrap around sheaves in an elevator system to perform the function of a conventional elevator rope. Beyond that, there is no benefit to adding any mold release agent taught by *Graff* to the arrangement of *DeAngelis*. *DeAngelis* is silent about any mold release concerns, most likely because it uses a conventional polyurethane material that includes wax, which acts as an internal mold release agent. The Examiner provides no explanation or basis for how the teachings of *Graff* provide any benefit in the *DeAngelis* arrangement. Without any benefit, there is no motivation to combine.

The *Scudder* reference teaches an arrangement where an oily substance layer is applied onto a polyurethane layer after it is partially cured. The *DeAngelis* reference uses extrusion molding to form the sheath 8. If one were to apply an oily substance after the material has partially cured as taught by the *Scudder* reference, that would require applying the oily substance after the sheath 8 exits the extrusion mold. That would result in an oily exterior surface of the *DeAngelis* sheath 8. An oily exterior on the sheath would interfere with the ability of the *DeAngelis* cable to operate in a conventional elevator system. There would be no ability to obtain sufficient traction for driving the

system, which depends upon traction between the sheath 8 and a traction sheave within an elevator system, for example. Accordingly, adding the teachings of the *Scudder* reference to the *DeAngelis* arrangement would defeat the intended operation of *DeAngelis*. There is no motivation for making the improper combination.

Additionally, there is no benefit to adding the teachings of the *Scudder* reference to that of *DeAngelis*. The *Scudder* reference is intended to address the issue where a second moving surface contacts a partially cured polyurethane layer that is supported on a first moving surface. Because there is no such technique used in the *DeAngelis* reference, which relies upon extrusion molding, there would be no benefit to adding the oily layer of *Scudder* to the arrangement of *DeAngelis*. Without any benefit, there is no motivation for making the combination and none of the claims can be considered obvious.

Moreover, *DeAngelis*, *Graff* and *Scudder* all use materials that are not the same as a waxless urethane. The Examiner has not pointed to any teaching within any of those references that teaches a waxless urethane as used in the methods claimed by Applicant. Therefore, even if the combinations could be made (and they cannot as explained above), the result is not the same as the claimed invention and none of the claims are obvious.

#### **CLAIMS 6-8 AND 16-23 ARE ALLOWABLE**

As discussed above, there is no motivation for making a combination of *DeAngelis* with *Graff* or *Scudder* and there is no *prima facie* case of obviousness. Further, the improper combination does not disclose or suggest using a waxless urethane as claimed and, therefore, none of the claims are obvious.

**THE REJECTION UNDER 35 U.S.C. §103  
BASED ON THOMSON IS IMPROPER**

Claims 18-20 and 22 are rejected as being obvious over *Thomson*. The Examiner contends, “A coating has a rectangular cross-section would have been an obvious choice of shaped type based upon the application and design choice of the worker.” Applicant respectfully disagrees.

As discussed above, the *Thomson* reference discloses a particular arrangement for having interconnection between the different strands that are coated with individual sheaths. Moreover, *Thomson* points to no less than nine specific benefits for the “continuous cylindrical outer surface of the cable” and the face-to-face engagement between the individual sheaths on the strands. If one were to change the arrangement of *Thomson* to have a rectangular cross-section, the benefits of *Thomson* would be lost. In fact, as quoted above, *Thomson* states that “flattening” of the cable should be avoided. Column 4, line 27.

Any proposed modification of a reference that defeats its intended purpose or causes the loss of its benefits, cannot be made when attempting to establish a *prima facie* case of obviousness.

It is impermissible to use hindsight reasoning to interpret the *Thomson* reference in a way that could somehow lead to the result provided by Applicant’s invention. Nothing within *Thomson* can possibly be construed as teaching a rectangular cross-section as suggested by the Examiner. Such a modification goes directly contrary to the express teachings of *Thomson*.

**CLAIMS 18 AND 19 ARE NOT OBVIOUS**

Claim 18 specifically recites coating a plurality of elongate load carrying members with a rectangular, waxless urethane coating. Because the *Thomson* reference teaches coating configurations that are not rectangular for a specific reason to provide specific benefits, it cannot be considered an obvious matter of design choice to change that configuration into a rectangular configuration. Claims 18 and 19 cannot be considered obvious.

**CLAIM 20 IS SEPARATELY PATENTABLE**

Claim 20 adds the limitation that the entire plurality of load carrying members are coated with a single urethane coating. *Thomson* expressly teaches multiple coatings because each strand has its own sheath. The interactions between the sheaths provide the benefits touted by *Thomson* as that references' contribution to the art. If one were to modify the *Thomson* reference to eliminate its multiple coatings or sheaths and replace those with a single coating, the functionality of that arrangement is entirely lost. A reference cannot be modified in a manner that defeats its intended operation when attempting to establish a *prima facie* case of obviousness. It is not possible to consider claim 20 obvious in view of *Thomson*.

**CLAIM 22 IS SEPARATELY PATENTABLE**

Claim 22 depends from claim 21 and includes a single, waxless urethane coating that has a rectangular cross-section. *Thomson* does not disclose a waxless coating and nowhere discloses a rectangular cross-section. Even if one could ignore the express teachings of the *Thomson* reference

and modify it to provide a rectangular cross-section, which cannot be done as already discussed, there still is no teaching of a waxless urethane and claim 22 cannot be considered obvious.

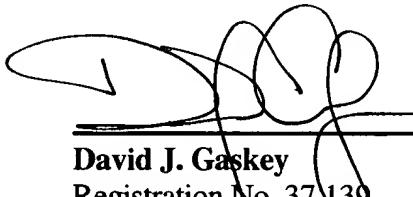
The rejections under 35 U.S.C. §103 must be reversed.

**CONCLUSION**

There is no anticipation because none of the references teach a waxless urethane. None of the claims can be considered obvious because there is no motivation for making the proposed combinations or modifications to the cited references. Additionally, even if any of the Examiner's proposed combinations or modifications could be made, the result is not the same as the claimed invention. All rejections must be reversed.

**Respectfully submitted,**

**CARLSON, GASKEY & OLDS, P.C.**



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March 19, 2004

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**CERTIFICATE OF MAIL**

I hereby certify that the enclosed **Appeal Brief (in triplicate)** is being deposited with the United States Postal Service as First Class Mail, postage prepaid, in an envelope addressed to Mail Stop AF, Commissioner For Patents, P. O. Box 1450, Alexandria, VA 22313-1450 on March 19, 2004.



Theresa M. Palmateer

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## APPENDIX OF CLAIMS

6. A method of making an elevator rope assembly, comprising:  
arranging a plurality of elongate load carrying members in a selected arrangement; and  
coating the load carrying members with a urethane coating that does not contain wax.
7. The method of claim 6, including using a thermal polyurethane coating.
8. The method of claim 6, including positioning the load carrying members within a mold and applying a release agent to the mold to enhance an ability to remove the rope assembly from the mold after the load carrying members are coated with the urethane coating.
16. The method of claim 6, including coating the load carrying members such that the urethane coating has a rectangular cross-section.
17. The method of claim 6, including coating the entire plurality of load carrying members with a single urethane coating.
18. A method of making an elevator belt, comprising:  
coating a plurality of elongate load carrying members with a rectangular, waxless urethane coating.
19. The method of claim 18, including using a thermal polyurethane coating.

20. The method of claim 18, including coating the entire plurality of load carrying members with a single urethane coating.
21. A method of making an elevator rope assembly, comprising:  
coating an entire plurality of elongate load carrying members with a single, waxless, urethane coating.
22. The method of claim 21, including coating the load carrying members with a coating having a rectangular cross-section.
23. The method of claim 21, including using a thermal polyurethane coating.

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